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which appeared several years ago. The first impression was that this smaller volume was written around a set of illustrations of respectable age, but for the most part still serviceable. More careful reading, however, makes it clear that we are dealing with a pretty good elementary presentation of the subject, and that our first impression was not altogether just. We are ourselves somewhat skeptical of the scientific value of physiology in the secondary schools. Everything depends here upon the excellence of the teacher, and a good one will find M'Kendrick's book useful. It is to be sure, quite uneven, and in some places there is more detail than can be taken in by the class of students which the author seems elsewhere to have in mind. Much of the discussion is given with evident care and discrimination, and the facts presented are in general, despite the necessary brevity, quite fully modernized; even argon and the hot and cold spots are not forgotten, and the problems of interstitial secretion are suggested. There are, to be sure, many points on which one may well differ with the author, but most of them are perhaps not such as to involve serious defects. It must be said that the account of the nerve cells is altogether inadequate. The picture of them (Fig. 140) is quite in opposition to our present views and will make a stronger impression, we fear, than the explanation which partially corrects them and also shows that Professor M'Kendrick is well aware what the prevailing view is. The description of voice production is unsatisfactory and requires fuller illustrations without which most young students must find Fig. 164 hard to understand.

JOSEPH W. WARREN.

BYRN MAWR COLLEGE.

The Story of a Piece of Coal—What it is, whence it comes and whither it goes. By EDWARD A. MARTIN, F.G.S. New York, D. Appleton & Co. With thirty-eight illustrations. 16mo. Pp. 168.

Mr. Martin's little book shows that the author has read widely, has selected judiciously and has told the story pleasantly. The narration is attractive, and is likely to be commended by the readers for whom it is intended.

All this makes one regret that the judicious selection was not associated with accurate reading. There are serious slips in too many places, and there is too much of positive assertion where modest suggestion would be preferable. As for some of his statements, it must be said that he should have every opportunity to prove them, since many persons would not accept them without hesitation.

Among other things, he tells us that iron, silver and water alone possess the power of expanding, when passing from the liquid to the solid state (p. 80); that no explosions in the anthracite region of Pennsylvania were due to coal dust (p. 100); that coke if properly made, should consist of pure carbon, and that good coal should yield as much as 80 per cent. of coke in the gas retort (p. 109); that our anthracite is inexhaustible, and that the 'mammoth vein' extends for 650 miles along the west bank of the Susquehanna (p. 147).

Mr. Martin says (p. 152) that Britain will feel, with tremendous effect, the blow to her prestige when the first vessel laden with coal weighs anchor in a British harbor. Three such blows were administered in 1896 by one Kentucky concern, and the attack has been continued this year by another.

J. J. STEVENSON.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON, 276TH MEETING, SATURDAY, APRIL 24.

MR. M. A. CARLETON spoke on 'Climate as an Element in Wheat Environment,' his remarks being mainly a comparison of the conditions prevailing in the wheat belt of southern Russia with those found in the western United States. He stated that low temperature, accompanied by aridity, prevented the raising of spring wheat, and that the successful ripening of grain did not depend on the average temperature, but on the total temperature of the hottest months. Mr. Frederick V. Coville presented a paper on the 'Plantfood of the Wild Ducks in Chesapeake Bay,' and particularly of the canvas back and its favorite food of the tubers of the wild celery. A large portion of the best feeding ground of the upper Chesapeake was de-

stroyed a few seasons ago by a combination of strong winds and heavy snowfall, followed by cold, the result being that exceptionally low water was produced, ice formed on the exposed flats, and when the tide finally came in the plants were torn away and carried off. Mr. Coville noted the conditions under which the shallow water could be restocked with the wild celery, and stated that it had been successfully transplanted to Western lakes, with the desired result of causing the canvas backs to linger there on their migrations.

Mr. Coville also described 'The Water Hyacinth, *Piaropus crassipes*, as an obstruction to navigation in Florida,' saying that in some of the shallow rivers the accumulation of the plants impeded the progress of the steamers. He showed a view of steamers so surrounded by the water hyacinth that they appeared to be lying in a meadow, and described the experiments made with a view to the possibility of destroying the plants.

Mr. Lyster H. Dewey described 'The Eastern Migration of Certain Weeds in America,' saying that the general trend of weed migration in the States east of the Rocky mountains, except in New England, has been westward, corresponding with the direction of the progress of cultivation and the movement of the supply of field seeds. In New England weeds have spread to the eastward, as illustrated by the Canada Thistle, *Carduus arvensis*, and the Orange hawkweed, *Hieracium aurantiacum*, introduced into Vermont and New York, and spreading from these States eastward. Yellow daisy, *Rudbeckia hirta*; bracted plantain, *Plantago aristata*; low amaranth, *Amaranthus blitoides*; marsh elder, *Iva xanthifolia*; buffalo bur, *Solanum rostratum*; squirrel tail, *Hordeum jubatum*, and Russian Thistle, *Salsola kali tragus*, are given as instances of weeds that have spread to the eastward. While the westward migration of weeds has been largely through impure field seeds, the eastward movement appears to be chiefly along railroads, in baled hay, grain and wool.

277TH MEETING, SATURDAY, MAY 8.

THE entire evening was devoted to the presentation and discussion of a paper by Dr. C. Hart Merriam, on 'Suggestions for a New

Method of Weighing Species and Subspecies,' which appeared in the last issue of SCIENCE.

F. A. LUCAS,
Secretary.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the regular meeting of April 14, 1897, Mr. H. W. Turner read a paper on 'A new Amphibole-pyroxene rock and some Orbicular rocks from California.'

The new amphibole-pyroxene rocks consists of original augite and amphibole in grains, of nearly equal size, with a little quartz and some pyrrhotite. The rock contains numerous phenocrysts of brown amphibole, which contain in a poikilitic manner the constituents of the ground mass. This rock is one type of a very interesting series of basic igneous rocks found in the foot hills of Mariposa county, California.

Some orbicular rocks were exhibited, as well as an inclusion in granite, around which an aureole, composed of amphibole, had formed. The material of this aureole appears to have been segregated from the granite. Two specimens of dikes were exhibited, the center of each of which contained more silica than the borders. Reference was also made to dikes in the rainy lake region, shown by Lawson to have an interior portion more siliceous than the borders. It is well known, as a general rule, that the less siliceous elements crystallize out first in all rock magmas. The walls of the dike being cooler, the less siliceous minerals would crystallize out first along the border, and the more acid minerals be transferred by convection currents, or in part crowded out by the already crystallized material toward the interior. It is evident that along the borders of an intrusive area of great size the same phenomenon might be shown. We should simply have the case of one side of the dike. The laws of thermochemistry would appear to be applicable to this case, inasmuch as the heat generated by the crystallization of the minerals might aid in establishing convection currents to transport the residual siliceous constituents away from the already consolidated material.

Under the title 'Laccoliths in Folded Strata,' Mr. W. H. Weed described the occurrence of a number of lenticular masses of intrusive rock

in the axes of folds, in the mountain groups of the plains of Montana, and one of the front ranges of the Rocky Mountains. In applying the term laccolith to such masses there is a wide departure from the original use of the word. It is therefore used provisionally, the right being reserved to designate such concavo-convex lenticular masses by an appropriate name at a future time.

The presence of such intrusions is believed to be due to causes in marked contrast to those of laccoliths. On the normal laccolith the intrusion causes the arching of previously horizontal strata. In the masses described the intrusion follows or accompanies the folding and is dependent upon it; that folding is the cause and not the result of igneous intrusion. The author offers a theory to explain the intrusion of such masses, utilizing the discussion of folds by Willis and by Van Hise to show that intrusion from below would be most easy at the hinge of such uplifts or the arch of synclines, and that such intrusion could not penetrate far, owing to compression near the concave surface of arches, so that further intrusion would be along a strata or other bed of easy parting toward the center of the fold when the presence of an arch due to a competent strata of limestone would leave a space beneath of little compression and consequent easy filling by the liquid magma.

W. F. MORSELL.

U. S. GEOLOGICAL SURVEY.

SCIENCE CLUB OF NORTHWESTERN UNIVERSITY.

At a meeting of the Science Club of Northwestern University, held on Friday evening, May 7th, inst., a paper was read by Miss Mary E. Gloss on the 'Mesophyll of Ferns.' The theory of the formation of the palisade tissue in intense sunlight does not seem to apply in the case of ferns. All the species examined were grown in diffused light, with one exception; some have palisade parenchyma and some have not; the presence or absence of the palisade parenchyma was nearly constant throughout each of the genera examined, which may prove to be a generic characteristic. The presence or absence of chlorophyll in the epidermis, the form and arrangement of the cells of the mesophyll, the size of the air spaces and the

thickness of the mesophyll appear to be nearly constant in each of the genera examined. The genera most carefully examined were *Adiantum*, *Aspidium*, *Nephrolepis* and *Polypodium*. The investigation will be continued until a large number of genera has been covered.

THOMAS F. HOLGATE,
Secretary.

THE TEXAS ACADEMY OF SCIENCE.

At the May meeting of the Texas Academy of Science, held on the evening of the 7th inst., the following papers were presented:

'The Properties of the Living Substance,' by Dr. Edmund Montgomery, of Hemstead, Texas.

'An Account of some Applications of the Bessel Functions to Astronomy,' by Harry Y. Benedict, of Cambridge, Mass.

'A Note on a Generalization of the Numbers of Couchy,' also by Mr. Benedict.

'Triazines and Triazoles,' by James R. Bailey and S. F. Acree.

'On the Constitution of a By-product obtained in the Preparation of Hydrazopropionic Acid,' by James R. Bailey and Henry B. Dechard.

The last named papers embody the results of some original work performed in the chemical laboratory of the State University, under the direction of Mr. Bailey, the senior author.

Major Dutton's address on the 'The Economics of Concentrated Capital,' and Professor Nagle's paper on 'Vertical Curves for Railways,' now in press, will be ready for distribution in a few days.

FREDERIC W. SIMONDS.

UNIVERSITY OF TEXAS.

NEW BOOKS.

Grundriss der Entwicklungsgeschichte der Menschen und der Säugetheere. OSCAR SCHULTZE. Zweite Hälfte. Leipzig, Engelmann. 1897. Pp. vii+468. M. 6.

Dynamic Sociology. LESTER F. WARD. New York, D. Appleton & Co. 2d Ed. 1897. Vol. I., pp. xl+706. Vol. II., pp. vii+690.

Bird Life. FRANK M. CHAPMAN. New York, D. Appleton & Co. 1897. Pp. xii+269. \$1.75.

Antiquities of Tennessee. GATES P. THRUSTON. Cincinnati, The Robert Clarke Co. 1897. Pp. xv+369.